Reference | 201208
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Date | 2nd March 2012
Main Supervisor | Brendan Keely
Main Supervisor’s Department | Chemistry
Co-supervisors’ name(s) and Departments | Julie Wilson, Maths/Chemistry
Project Title | Excavation**: digging for meaning in complex chemical data from archaeological grave soils using chemometric approaches

**Project Description**
As part of a collaborative study between Chemistry and Archaeology a wealth of data has been generated from the chemical analysis of intensively sampled archaeological grave soils. Thus, absolute and relative abundances of compounds from different compound classes and representing both solvent soluble (e.g. lipid) and solvent insoluble components of the soil organic matter (e.g. biopolymeric) have been determined. Similar analyses have been shown to be of interpretative value in modern burials.¹ For a many of the graves the presence of a few specific compounds that hold particular significance in relation to their sources or transformation pathways has enabled interpretations to be drawn about specific aspects of the burial, preservation or individual interred.

The aim of the project is to explore the distributions of chemical components for meaning that is not immediately apparent. For example, meaning can be expected to encoded within the relative abundances of components that are not source-specific in their origins. Thus, a key objective is to determine which combinations of chemical components within the complex distributions best discriminate samples according to their position relative to the skeletal remains and the age/soil type/style of burial. Such data is of key importance in interpreting burials where the skeletal remains are partly or completely absent either through degradation or disturbance. It is envisaged that the data will be interrogated using statistical methods both at the level of subsets of components (typically as defined by chromatographic behaviour during fractionation) and at the level of the entire distributions.

**Required skills**
The key skills required of the applicant are: a good understanding of and aptitude with mathematical and statistical methods; reliability in the manipulation of large datasets and in recording of the steps taken; highly developed skills in data interpretation. Knowledge and understanding of the nature and significance of chemical data will be a distinct advantage. Training in the use of advanced statistical packages will be provided as appropriate.

**Project dates**
9 weeks, starting on Monday 16 July 2012 and finishing on Friday 14th September.

**References**